Film Study: Gattaca **Due:**

**GENES AND GENETICS**

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| **Deoxyribonucleic acid**  (Don’t worry: you don’t have to remember the long name)  In 1953, scientists James Watson and Francis Crirk announced that they had made a momentous achievement. The discovering of the double helix structure was announced but the complications of mapping the entire human gene sequence was years away.  DND is a substance inside the cells of all animals, plants and other living organisms. DNA contains the **genetic** **information** that tells the **cells** how to behave. Every living thing has one set of DNA (like a set of instructions) which is stored inside every cell in their body.  DNA is often referred to as a ‘blue print’ for life. Our DNA tells the body how to grow (what colour our eyes, hair and skin will be, whether we will be short tall or short, hairy, cross-eyed, good looking), right down to how the organs inside us will develop. How much of our personalities and our lives are determined by our genes is a matter of great debate and one of the main themes in *Gattaca.* |  |

**LOOK CAREFULLY AT THE FILM TITLE, OPENING CREDITS AND NAME REFERENCES.**

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| Spiral Staircase | The film gets it title from the four letters (G, A, T and C) that are used by scientists to record DNA. Every person’s DNA can be coded using these letters, which represents the different bonds in the genes. The way that DNA is structured, in a double helix (see picture above) it is also a recurring visual theme in the film (the staircase in Jerome’s apartment). |

The opening credits are also symbolic. Each name emerges onscreen from different combinations and placing of four letters **G A T A** (four base nucleotides, building blocks of DNA, joined in double helix molecule: **G**uanine, **A**denine, **T**hymine, **C**ytosin).

Jerome Morrow lacks any of these letters (as though he is inert, non-human perhaps?), although EuGene (well born) and VinCenT (‘successful one’, someone who overcomes) and FreemAn together have all the necessary components of base code to make and continue creating life.

Gattaca comments on the way in which Vincent and Anton are conceived. INVALID Vincent’s admission that he’s a ‘God-Child’ embarrasses Irene because, to her, his parents behaved irresponsibly. His resume is in his cell, as he says, and so he is discriminated against in education and job-choice. Even VALID Anton was engineered with degree of ‘chance’ features, while Jerome/Eugene’s genetic makeup was rigorously engineered to give him advantage.

**THE HUMAN GENOME PROJECT AND SEQUENCING**

The Human Genome Project was formally initiated in 1990. It took a world wide effort to sequence the estimated 35, 000 human genes and was completed in 2003. A genome is complex and precious: it is a total ‘map’ or coded sequence of genes that determine what an organism will be like.

http://www.yourgenome.org/downloads/animations.shtml

**Eugenics**

Eugenics (‘good breeding’) is the science of using hereditary characteristics to breed better humans. Eugenics, attempt to improve species through controlled breeding and needs political and social structures to implement such a programme. It is an ancient idea – full of moral and ethical issues.

**Genetic Engineering**

Genetic Engineering describes the technology by which genes can be identified, isolated, turned on or off, snipped out of DNA strand and reinserted somewhere else, or otherwise modified to combat disease or defects.

Long before genetic engineering became a science, Francis Galton (Charles Darwin ‘s cousin) published his study of **Hereditary Genius** (1869), which advocated ‘careful selection’ to breed in ‘desirable characteristics’ and avoid a ‘dysgeny’, a decline in human ‘quality’. Who decides?

Fired by media hype, it is easy for ordinary people to assume that genetic engineering is about to make huge medical advances. Dolly the sheep was cloned in 1997, now stem cell research is handling tiny replicating bits of ‘morality’. Cloning raised anxieties about issues of individuality and as science makes leaps and bounds in advancements, we are faced with ongoing ethical, philosophical and moral concerns.

**Answer the following questions in detailed paragraphs. Support your answers with evidence from the film where possible.**

1. Explain the relevance and symbolism of the letters G A T C in the film.

2. Make a comment on the characters names that are mentioned.

3. Explain the following terms that are used in the film and give examples:

- Invalid

- God-child

- being sequenced

- genoism

4. In your own words explain what eugenics is and how is it explored in the film.

5. Eugenics is an ancient idea full of moral and ethical issues.

Explain what this sentence means. Give examples not only from the film but also how eugenics has been used and abused throughout history.

6. What are the pros and cons of genetic engineering?